REMARKS

Claims 1-29 are pending and at issue. Reconsideration of the pending claims is requested in view of the remarks below.

§ 112, Second Paragraph Rejection

Applicants respectfully traverse the rejection of claims 1, 20, and 21 under 35 U.S.C. § 112, second paragraph for being indefinite. Claim 1 is amended to remove the "computer means" language and thus, the rejection is now moot and should be withdrawn. Claims 20 and 21 are amended to remove the multidependent claim language and instead incorporate the language of the necessary base claims. Thus, the rejection of claims 20 and 21 are now moot and should be withdrawn.

§ 101 Rejection

Applicants respectfully traverse the rejection of claims 1-29 under 35 U.S.C. § 101 as directed to non-statutory matter. As suggested by the office action, Applicants have amended independent claims 1 and 29 to recite either a method performed by a processor in connection with a memory or a computer program product stored in a central unit memory and run on a processor comprising an interaction matrix stored in a first memory of the central unit, a first column matrix stored in a second memory of the central unit, and a second column matrix stored in a third part of memory of the central unit. It follows, that each of the claims 1, and claims 2-28 depending therefrom, and claim 29 now recite an application using a processor and memory as suggested by the office action. Thus, each of claims 1-29 are now directed to patentable subject matter under 35 U.S.C. § 101 and the rejection should be withdrawn.

§ 103 Rejection

Applicants respectfully traverse the rejection of the pending claims as obvious in view of Placko et al. (SPIE Proceedings Vol. 4335, July 2001) and Tsingos ("Geometrical Theory of Diffraction for Modeling Acoustics in Virtual Environments," SIGGRAPH 2001). Each of the pending claims recites an obstacle that receives a main wave and that emits, in response to the main wave, a secondary wave, where the surface of the obstacle corresponds to an interface between a first medium and a second medium, and where the main wave propagates in the first medium. Each of the pending claims further recites meshing, in part, a surface of

the obstacle into a plurality of surface samples each having an associated hemisphere where a point of contact between the surface sample and hemisphere is a predetermined point corresponding to a coefficient in a second column matrix. Each of the pending claims further recites that the hemisphere is oriented inwardly for a propagation of said secondary wave in said second medium, and outwardly for a propagation of said secondary wave in said first medium.

Neither Placko et al. nor Tsingos discloses meshing a surface of an obstacle into a plurality of surface samples, where the obstacle receives a main wave and emits a secondary wave. Further, neither Placko et al. nor Tsingos discloses orienting a hemisphere inwardly for a propagation of a secondary wave in a second medium, and outwardly for a propagation of the secondary wave in a first medium (where the main wave propagates in the first medium). Therefore, no combination of Placko et al. and Tsingos can render the pending claims obvious.

Placko et al. et al. fails to disclose or suggest meshing a surface of an obstacle into a plurality of surface samples, where the obstacle receives a main wave and emits a secondary wave. As an initial matter, the office action appears to consider a metallic plane in front of a sensor (at page 58, second paragraph, lines 1-2) as the recited obstacle. However, Placko et al. fails to disclose meshing the surface of the metallic plane (considered an obstacle by the office action) into a plurality of surface samples, nor does Tsingo disclose such a limitation. Thus, for this reason alone, no combination of Placko et al. and Tsingo can render the pending claims obvious.

Further, the office action acknowledges that Placko et al. fails to disclose orienting a hemisphere, associated with an obstacle surface sample, inwardly for a propagation of said secondary wave in said second medium, and outwardly for a propagation of said secondary wave in said first medium, and instead cites Tsingo to remedy the deficiency. However, Tsingo, also fails to recite orienting a hemisphere associated with an obstacle surface sample inwardly for a propagation of said secondary wave in said second medium, and outwardly for a propagation of said secondary wave in said first medium.

While Tsingo discloses subdividing the space between a source and receiver (See Figure 2), Tsingo fails to disclose, in any manner, meshing an obstacle (for example, a receiver of a wave) into a plurality of surface samples. In fact, none of the calculations disclosed in Tsingo describe meshed surface samples, in any manner. Because Tsingo fails to disclose any meshed surface samples of an obstacle, Tsingo does not disclose a hemisphere associated with a meshed surface sample, much less a hemisphere having a point of contact with the surface sample, as recited by the pending claims.

Moreover, even if one could read any portion of the objects of Tsingo as a meshed surface sample, the diffraction patterns of Tsingo (as shown in Figures 1 and 8 of Tsingo) are not the hemispheres recited in the pending claims. In particular, the pending claims recite that a point of contact between the surface sample and associated hemisphere is a predetermined point corresponding to a coefficient in a second column matrix. Tsingo fails to disclose that its spherical diffraction patterns contact any a predetermined point corresponding to a coefficient in a second column matrix.

Still further, the orientation of the diffraction patterns of Tsingo are opposite of the orientation recited in the pending claims. Specifically, the pending claims recite that the surface of an obstacle corresponds to an interface between a first medium and a second medium, where the main wave propagates in said first medium, and where the hemisphere is oriented inwardly for a propagation of said secondary wave in said second medium, and outwardly for a propagation of said secondary wave in said first medium. As shown in Figure 1 of Tsingos, however, wave propagation into a second medium from a first medium (in which the main wave propagates) produces an outwardly oriented hemisphere. Also, as shown in Figure 8 of Tsingos, wave propagation back into a first medium from a diffraction wedge shows an inwardly oriented hemisphere, which is also opposite the claimed orientation.

Because neither Placko et al. nor Tsingos discloses meshing a surface of an obstacle into a plurality of surface samples or orienting a hemisphere associated with a surface sample as recited by the pending claims, no combination of Placko et al. and Tsingos can render the pending claims obvious.

Furthermore, neither Placko et al. nor Tsingos provides a suggestion or motivation to combine or modify their teachings to produce the claimed combination, nor the Applicants understand how this can be done. Specifically, Tsingos involves extending a beam tracing algorithm to account for diffraction that does not use matrices, while Placko et al. discloses a matrix system involving coefficients related to hemispherical bubble calculations. As discussed above, the hemispherical bubble calculations used in Placko et al. are unrelated to diffraction patterns described in Tsingos, and thus the underlying theories of the two references do not even appear to be compatible. The office action appears to cite Tsingos merely because it discloses a spherical shape diffraction pattern and generally relates to the physics of waves. Other than this fact, however, Tsingos has no relevance to the problems or methods described in Placko et al. For the further reason that neither Placko et al. nor Tsingos provides a suggestion or motivation to combine, no combination of Placko et al. and Tsingos can render the pending claims obvious.

CONCLUSION

Applicants submit that this case is in a condition for immediate allowance. For the foregoing reasons and for other reasons clearly apparent, Applicants respectfully request reconsideration and allowance of rejected claims 1-29.

If there are matters that can be discussed by telephone to further the prosecution of this application, Applicants respectfully request that the Examiner call its attorney at the number listed below.

The Commissioner is authorized to charge any fee deficiency required by this paper, or credit any overpayment, to Deposit Account No. 13-2855.

Respectfully submitted,

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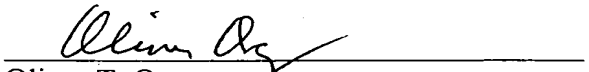
By: 

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